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IS 4182 (1988): Misch metal [MTD 5: Ferro Alloys]

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UDC 669·85/·86 (First Reprint SEPTEMBER 1991) IS : 4182 - 1988

(Reaffirmed 2000)

Indian Standard

SPECIFICATION FOR MISCH METAL

(First Revision)

1. Scope — This standard covers the requirements of misch metal used in ferrous and non-ferrous industry.

2. Terminology — For the purpose of this standard, the following definitions shall apply.

2.1 *Cast* (*Melt*) — The product of any of the following:

a) One furnace heat, or
b) One tap of continuous furnace, or
c) A number of furnace or crucible heats of similar composition mixed in a ladle or holding furnace and used for making a cast.

2.2 *Batch* — A group of lumps of one grade, cast from the same cast/melt in accordance with **2.1**.

3. Grades — This standard covers four grades of misch metal as specified in Table 1.

4. Particulars to be Specified While Ordering — For the benefit of the purchaser, particulars to be specified while ordering for the material to this specification shall be as follows:

a) Quantity of the material;
b) Name of the material;
c) Grade;
d) Size range;
e) Necessary requirements for analysis reports, packing, etc, as appropriate; and
f) Shelf life.

5. Supply of Materials — General requirements relating to supply of material to this specification shall be as laid down in IS : 1387-1967 'General requirements for the supply of metallurgical materials (*revised*)'.

6. Chemical Composition — Each batch of the material shall conform to the requirements of chemical composition specified in Table 1 and if so specified by the purchaser at the time of enquiry and order, shall supply a test certificate of chemical analysis of the sample of material for each melt.

6.1 If specified by the purchaser at the time of enquiry and order that each lump of the batch should conform to chemical composition specified in Table 1, this shall be agreed to between the purchaser and the manufacturer.

6.2 The chemical composition given in Table 1 shows only the main constituent elements and the usual impurities. If the purchaser requires closer ranges for the main element contents and/or different limits for specified elements and/or non-specified elements, this shall be agreed to between the purchaser and the manufacturer.

6.3 The chemical composition of the material shall be determined either by the method specified in IS : 5425 'Methods of chemical analysis of misch metal', or any other established instrumental/chemical methods. In case of dispute, the procedure given in the latest version of IS : 5425 shall be the referee method. However, where the method is not given in IS : 5425, the referee method shall be agreed to between the purchaser and the manufacturer.

Ferro Alloys Sectional Committee, SMDC 8 [Ref : Doc : SMDC 8 (3058)]

Adopted 6 June 1988

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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TABLE 1 CHEMICAL COMPOSITION OF MISCH METAL, PERCENT

(*Clauses* 3, 6, 6.1 *and* 6.2)

Grade	Constituents, Percent				
	Cerium	Lanthanum	Total Rare-Earth Metals* *Min*	Iron *Max*	Impurities, Such as Aluminium, Magnesium, Calcium, Carbon and Silicon *Max*
Grade 1 (Low iron)	40-55	20-27	99	0·5	0·5
Grade 2 (High iron)	40-55	20-27	90	10	0·5
Grade 3 Cerium free Lanthanum rich (Low iron)	0·5	40, *Min*	99	0·5	0·5
Grade 4 Cerium free Lanthanum rich (High iron)	0·5	35, *Min*	90	10	0·5
Grade 5	40-50	20-25	80	16	0·5

*It may also include other rare-earth metals, such as neodymium, praseodymium and samparium.

7. Size Range — The material shall be supplied in lumps or as crushed and screened particles. The particle size ranges and tolerances shall be as given in Table 2. The undersize values shall be valid at the point of delivery to the purchaser.

TABLE 2 PARTICLE SIZE RANGE

Grade	Size Range, mm	Undersize, Percent by Mass, *Max*
1	2-50	3
2	2-25	5
3	Up to 2	—

8. Extraneous Contamination — The material shall be reasonably free from extraneous contaminations like slag and non-metallic inclusions, etc.

9. Sampling – Each batch of the material shall be sampled in accordance with IS : 1472-1977 'Methods of sampling ferro-alloys for determination of chemical composition (*first revision*)'.

10. Packing — The material shall be packed in suitable steel drums with the net contents varying from 5 to 25 kg, as mutually agreed to between the supplier and the purchaser.

10.1 The material shall also be covered with an appropriate aluminium paint to prevent oxidation during transportation and storage.

11. Marking — The material shall be marked with the following:

a) Supplier's name or trade mark,

b) Grade designation and size,

c) Quantity,

d) Date of manufacture, and

e) Shelf life.

11.1 *Standard Marking* — Details available with the Bureau of Indian Standards.

EXPLANATORY NOTE

Misch metal is an alloy of rare earth metals containing cerium, lanthanum, etc. Addition of misch metal to cast iron improves fluidity, oxidation resistance and strength. Misch metal improves the workability of austenitic stainless steels. Its addition to aluminium and magnesium alloys increases their strength at high temperature. In nickel alloys, addition of misch metal improves their resistance to high temperature oxidation. The use of misch metal in steels has a pronounced effect on quantity, shape and distribution of inclusions, particularly sulphides. In addition, misch also finds applications in manufacture of permanent magnets and materials for hydrogen storage and transportation.

This standard was first issued in 1967. In view of the experience gained during these years, it was felt necessary to revise this standard. The following main modifications have made in this revision:

a) Provision for particle size range has been made;

b) Clauses pertaining to chemical analysis have been modified and information to be given while ordering the material has been incorporated for the benefit of the purchaser;

c) Existing Grade 3 (Lanthanum enriched) has been deleted. Three additional grades out of which two grades (Cerium free Lanthanum rich) having low iron and high iron content have been incorporated;

d) New clauses have been incorporated to avoid wide segregation of the chemical constituents, thereby safeguarding the small consumers of this product; and

e) Packing clauses have been modified.

Reprography Unit, BIS, New Delhi, India